HERPETOFAUNA OF THE PACIFIC COAST OF NORTH CENTRAL BAJA CALIFORNIA, MEXICO, WITH A DESCRIPTION OF A NEW SUBSPECIES OF *PHYLLODACTYLUS XANTI*

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ABSTRACT.—Three species of lizards are recorded from the Pacific slope of Baja California, Mexico, for the first time: a leaf-toed gecko, *Phyllodactylus xanti sloani* n. subsp., *Crotaphytus collaris* and *Sauromalus australis*. The distribution, pattern, and scutellation of *Gerrhonotus multicarinatus* spp. indicates a southward expansion of its range since glacial maxima via the cool, moist, coastal corridor, and its possible integradation with *G. paucicarinatus*. A southward coastal corridor diffusion may also be true for *Tantilla planiceps eiseni, Coleonyx variegatus abbotti* and *Lichanura roseofusca gracia*. Of the 29 species of amphibians (2), lizards (16), and snakes (11) collected, only one lizard, *Cnemidophorous labialis*, is considered endemic to the Central Desert of Baja California. Homogeneity of habitats, the moderate climate and the extirpation of the Peninsular desert herpetofauna during glacial maxima probably have been important factors in reducing or limiting species diversity and endemism.

INTRODUCTION

The coastal deserts of North America, of which more than 2000 miles are confined to Baja California and Sonora, Mexico, remain biologically unknown because of their relative inaccessibility, lack of potable water, and rugged terrain. Wiggins (1960a) identified these and other regions in Baja California as in need of more careful biological exploration. One area he mentioned was the Pacific coastal region between El Rosario (30°N) and the southern boundary of the state of Baja California (28°N; Fig. 1). Excluding the immediate areas of El Rosario and Rosarito, where the main road approaches within ten miles of the ocean, this region has not been explored herpetologically.

In the spring and summer of 1969, I made several trips (Table 1) into the area in order to: 1) better ascertain the distributional limits of the herpetofauna, 2) gather ecological data; and 3) collect specimens for studies of geographical variation and evolution.

METHODS AND MATERIALS

A Taylor sling psychrometer and a Dwyer wind gauge (0-60 mph) were used to measure relative humidity and wind speed. A Taylor soil thermometer (0-50°C) and a multichannel tele-thermometer unit were used to record soil (approximately 0.5cm beneath surface) and air temperatures (approximately 0.5cm above surface). Time (Standard) is expressed in 24 hour fashion. Throughout this paper when counts or measurements are presented in the following manner: $11 \pm 1.3(10\text{-}12)18$, the first figure refers to the arithmetic mean, the second figure to the standard error of the mean, the figures in parentheses to the range, and the last figure to the number of observations. Occasionally, the standard error of the mean is omitted, but the order, with this exception, remains the same. Standard deviation is indicated by S.D.

All snout-vent measurements have been rounded off to the nearest whole number and other measurements to the nearest tenth.

Within each major systematic grouping the species are arranged alphabetically by genus. I have not been consistent in the treatment of subspecies and have omitted available trinomials where geographical variation is poorly known. All material collected has been deposited in the collections of the San Diego Society of Natural History.

SAN DIEGO SOC. NAT. HIST., TRANS. 16 (10): 237-264, 25 AUGUST 1971

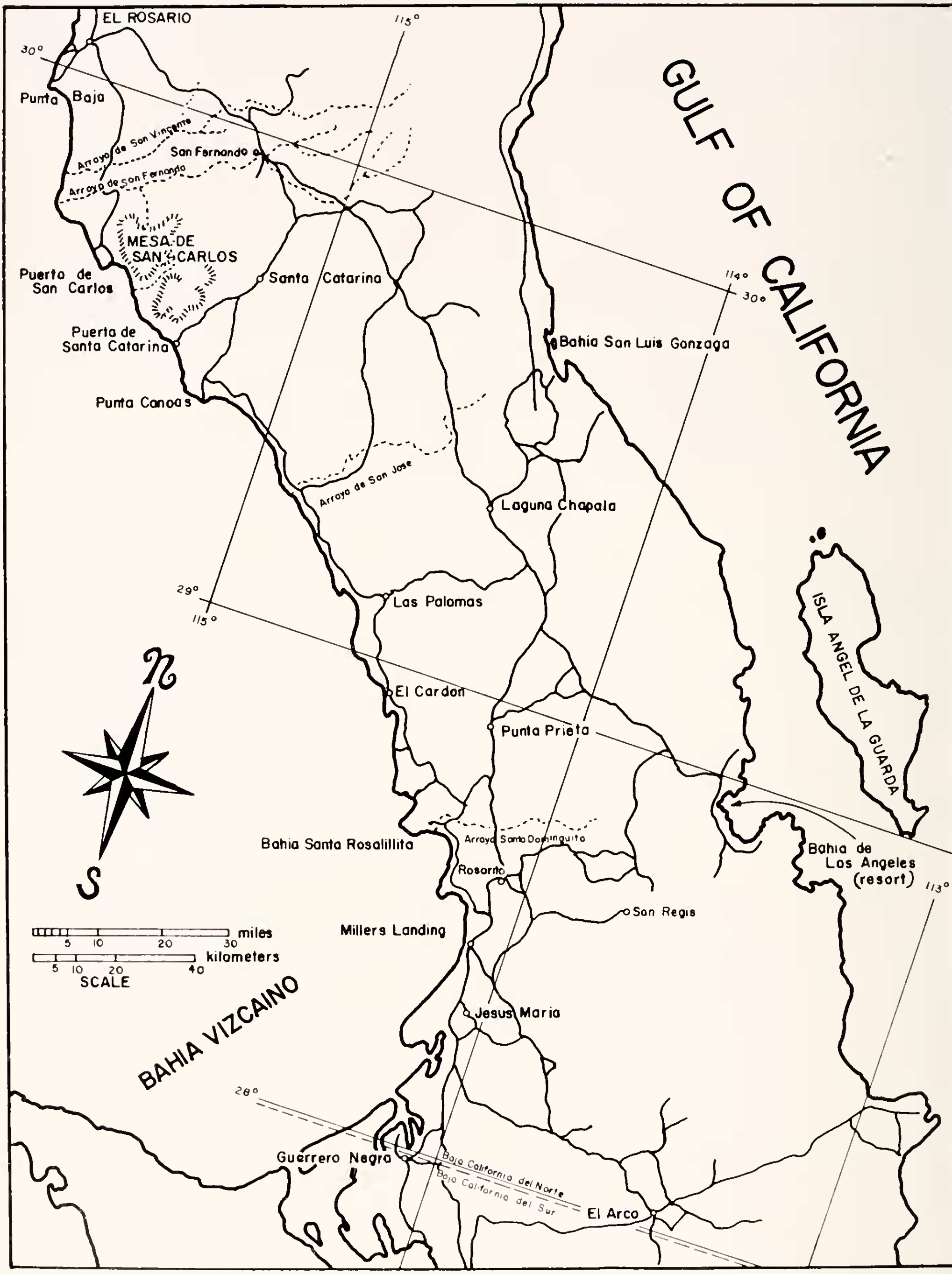

Figure 1. Map of the central region of Baja California, Mexico. Modified from Gerhard and Gulick, 1966.

DESCRIPTION OF THE AREA

GENERAL GEOGRAPHY

The Pacific coast of Baja California between 30°N and 28°N is notably irregular, with many small embayments. The coastal strand is hilly to mountainous, and is frequently interrupted with valleys, coastal plains and marine terraces. The only well-defined mountain range is the Sierra Colombia, with summits near 762 meters.

The area lies within the North American Desert Province (Shreve, 1942), but thus far there has been no agreement as to a name for that part of the province in the middle of the peninsula roughly delimited in the north by the southern tip of the Sierra de San Pedro

Table 1. Herpetological Collecting Stations in the Central Desert of Baja California del Norte, Mexico.

Station	Date	Locality
1	30 March	6.6 miles SE El Rosario; 30°01′N, 115°38′W
2	2-4 August	Punta Baja; 29°58′N, 115°49′W
3	3 April	11.8 miles SE El Rosario; 29°58′N, 115°33′W
4	3 April	19 miles SE El Rosario; (Rancho San Vicentito); 29°52′N, 115°33′W
5	30-31 March	23.5 miles SE El Rosario; 29°48′N, 115°33′W
6	1,3 April	24.5 miles SSE El Rosario (Arroyo de San Fernando); 29°47′N, 115°33′W
7	2 April	25 miles SSE El Rosario (Arroyo de San Fernando); 29°47′N, 115°33′W
8	3 April	San Felipe Springs (in Arroyo de San Fernando) ca. 9 miles NE of the arroyo-coastal road junction; 29°52′N, 115°26′W
9	1-2 April	1.8 miles NW Puerto de San Carlos; 29°40′N, 115°29′W
10	26-27 August	10.9 miles NE Santa Catarina Ranch; 29°53′N, 115°04′W
11	26 August	10.3 miles NE Santa Catarina Ranch; 29°52′N, 115°04′W
12	26 August	6.7 miles NE Santa Catarina Ranch; 29°49′N, 115°05′W
13	26 August	4.3 miles NE Santa Catarina Ranch; 29°47′N, 115°06′W
14	26 August	1.0 miles NE Santa Catarina Ranch; 29°44′N, 115°08′W
15	24 June	1.7 miles S Santa Catarina Ranch; 29°43′N, 115°08′W
16	26 August	2.9 miles S Santa Catarina Ranch; 29°41′N, 115°09′W
17	26 August	3.6 miles SW Santa Catarina Ranch; 29°40′N, 115°09′W
18	26 August	4.4 miles SW Santa Catarina Ranch; 29°40′N, 115°09′W
19	26 August	6.5 miles SW Santa Catarina Ranch; 29°39′N, 115°11′W
20	24-25 August	Mesa de San Carlos (SE); 29°38′N, 115°15′W
21	24-25 August	3.2 miles NE Puerto de Santa Catarina; 29°35′N, 115°14′W
22	25 August	0.5 miles NE Puerto de Santa Catarina; 29°33′N, 115°16′W
23	25 August	Puerto de Santa Catarina; 29°32′N, 115°16′W
24	24-25 June	Punta Canoas; 29°26′N, 115°11′W
25	25 June	5.4 miles NE Punta Canoas; 29°26′N, 115°06′W
26	26-29 June	Arroyo San Jose; 29°19′N, 115°51′W
27	30 June	15.5 miles S Arroyo de San Jose; 29°09′N, 114°42′W
28	30 June	16.6 miles NW Las Palomas; 29°14′N, 114°46′W
29	30 June	14.4 miles NW Las Palomas; 29°13′N, 114°46′W
30	30 June	10.6 miles NW Las Palomas; 29°09′N, 114°40′W
31	1-5 July	Las Palomas; 29°08′N, 114°33′W
32	5 July	16.6 miles SE Las Palomas; 28°57′N, 114°29′W
33	5-8 July	El Cardon; 28°56′N, 114°29′W
34	8 July	11.5 miles SE El Cardon; 28°50′N, 114°28′W
35	8 July	9.7 miles S Punta Prieta; 28°49′N, 114°10′W
36	9-12 July	Arroyo Santo Dominguito (2.8 miles NE Santa Rosalillita); 28°42′N, 114°15′W
37	12 July	10.8 miles SE Santa Rosalillita; 28°37′N, 114°12′W
38	12-15 July	0.5 miles N San Javier; 28°32′N, 114°05′W
39	15 July	Miller's Landing; 28°28′N, 114°05′W
40	15 July	4.4 miles S Miller's Landing; 28°25′N, 114°04′W
41	16-19 July	10 miles S Jesus Maria; 28°13′N, 114°02′W

Mártir, in the east by the peninsular divide, and in the south by the northern and northwestern borders of the great lava plateau, but with a Pacific strip extending further southward to the vicinity of Comondú. This semi-arid region was first named the Vizcaino Desert District by Nelson (1921) who made a biological survey of the peninsula in 1905-1906. Since then it has been called the San Borja Desert (Sauer and Meigs, 1927), the Vizcaino-Magdalena Desert (Jaeger, 1957), the Central Desert (Aschmann, 1959), the Peninsular Desert (Savage, 1960), and the Vizcaino Region (Shreve and Wiggins, 1964).

Sauer and Meigs' (1927) "San Borja Desert," based on a socio-economic division of the mission era, implies too restricted a geographical area, and Savage's (1960) "Peninsular Desert," is too inclusive. Jaeger's (1957) "Vizcaino-Magdalena Desert" is misleading. The Magdalena Plain, farther south on the Pacific drainage of the peninsula differs floristically from the Vizcaino Region (Shreve and Wiggins, 1964). I have chosen to call the area the "Central Desert" as suggested by Aschmann (1959) because it seems desirable to restrict the Vizcaino Desert, in accordance with local practice, to the dry coastal plain west of San Ignacio.

CLIMATE

Until 1963 few climatological data were available for Baja California, most of which were qualitative. Important additions to these data were presented by Hastings and Turner (1964, 1965a) and Hastings and Humphrey (1969).

Climatologically, the Central Desert may be classified on the origin of its climate (causally) and on the nature of its temperature (thermally), particularly in the winter. Causally, it is a cool coastal phase of a subtropical desert, the Sonoran; thermally, it may be classified as temperate.

The survey area is included within Meigs' (1966) "fog type" of temperate desert, and in the system of notation used in the UNESCO arid homoclimatic maps (Meigs, 1953) would be classified as Ac23—a desert climate with winter precipitation, the coldest month being between 10°C and 20°C (50°-68°F) mean temperature, and the warmest month between 20°-30°C (68°-86°F) mean temperature.

Table 2. Irregular observations (n) of wind velocity and direction.

	Wind Velocity (mph)			Direction		
	0700	1100	1500	0700	1100	1500
June	1.4-5.2 (5)	3.2-7.2 (5)	4.8-9.8 (5)	WNW(2) ENE(3)	WNW(5)	WNW(5)
July	0.6-3.2 (15)	3.0-8.2 (18)	3.7-10.4 (18)	W(5) NW(2) WSW(1)	W(14) NW(2)	W(12) SW(2)
August	0.0-2.2 (5)	1.9-9.8 (8)	1.3-8.6 (7)	W(1) SW(2)	W(3) SW(4)	W(2) SW(2) S(2)

The climate of the western coastal fringe of the Central Desert is greatly influenced by the cold California Current of the Pacific Ocean and the prevailing westerly winds (Table 2) which move layers of cool, moist air inland beneath dry descending air, producing considerable fog and cloudiness, but no precipitation, and very mild conditions.

In our survey, onshore movement of the moist marine air, often as fog or low clouds,

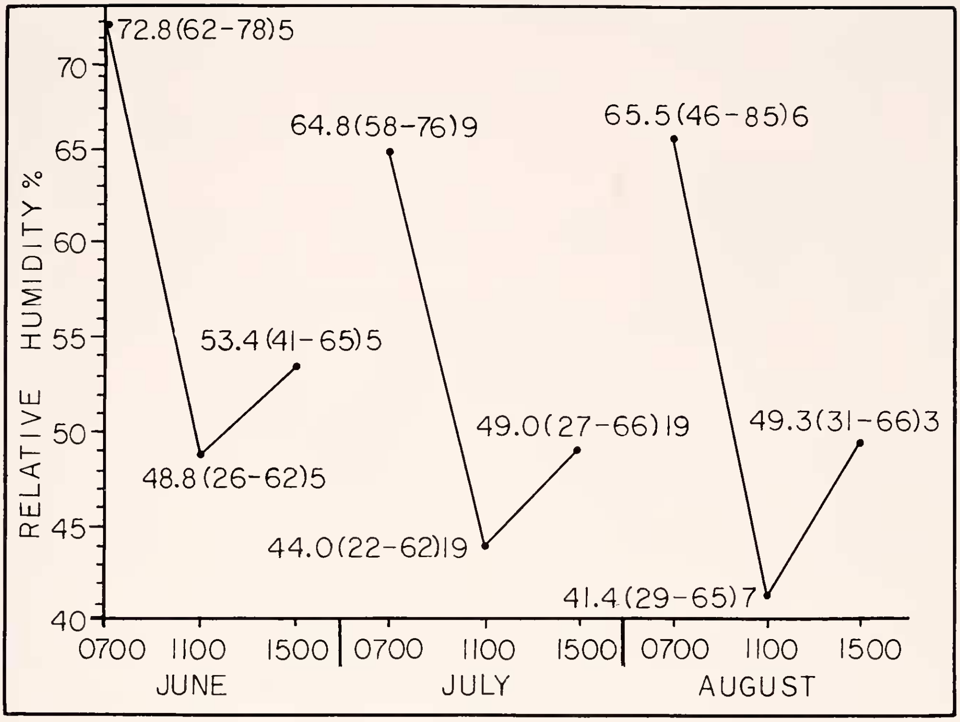

Figure 2. Relative humidity recorded in the Pacific coastal strand of the Central Desert of Baja California del Norte, Mexico, during June, July and August, 1969. The first figure refers to the arithmetic mean, the figures in parentheses to the ranges, and the last figure to the number of measurements.

generally began in mid-afternoon when wind velocities were greatest (Table 2). The relative humidity increased in mid-afternoon and dropped substantially in mid-morning when the fog and cloud cover dissipated (Fig. 2). The frequency and extent of the fog or cloud cover diminished rapidly with distance from the ocean. Although Arnold (1957) reported frequent fogs in the Chapala Basin, about 25 miles from the Pacific, during the spring and summer of 1949 and 1950, fog was seldom observed during this survey more than five miles from the ocean.

By late evening, along the coastal strand, visible drops of condensation formed on those objects that had cooled most rapidly after sunset, and by early morning substantial amounts of water, often 100 ml. or more, were present frequently in the depressions of rocks and in the axils of the basal leaves of *Agave.* Similarly, in the sandy soil beneath woody shrubs the extent of the plant drip was noticeable and, as recorded by Wiggins (1969) for shrubs of the Vizcaino Desert, often the subsoil was dampened to a depth of 4-5mm. Dr. James R. Hastings (pers. comm.) noted that on foggy mornings in the Vizcaino Region the ground was visibly more moist under *Opuntia cholla* and *Machaerocereus gummosus* than in open spaces, and that rivulets of condensate were observed running down the upper, concave surface of the leaves of *Yucca valida* and *Agave* sp., being funneled toward the caudex. Hastings and Turner (1965b) suggest that some plants of the Vizcaino Region may utilize the fog drip as a major source of water. Certainly the common epiphte *Tillandsia recurvata,* which grows on woody shrubs and succulents, is dependent upon dew, as are many of the lichens of the coast such as *Ramalina reticulata.* Distribution of these moisture-dependent

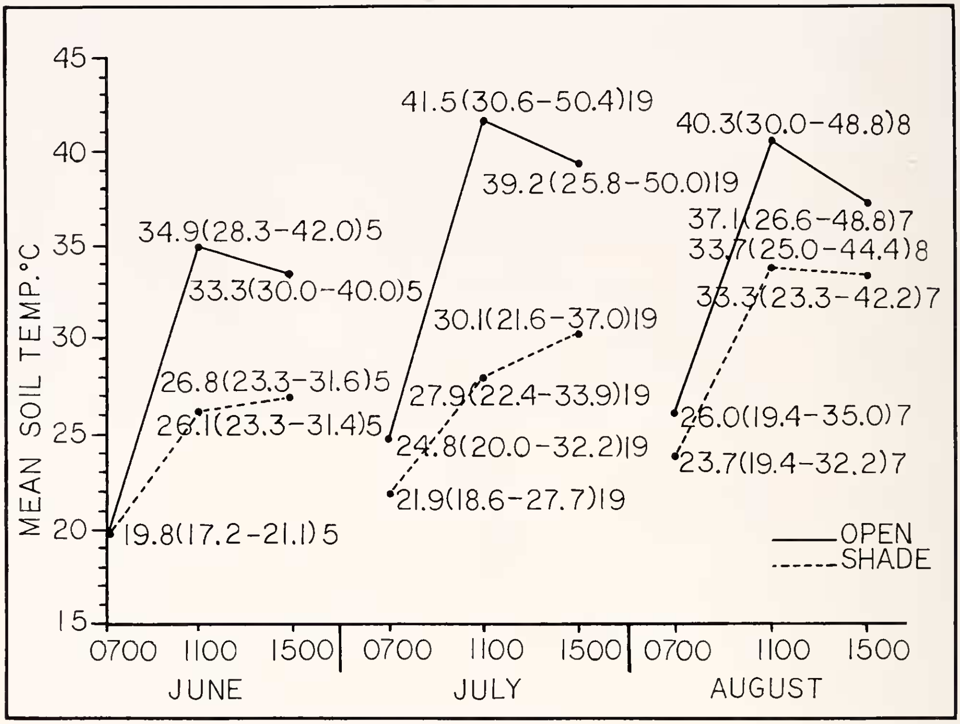

Figure 3. Soil temperatures recorded at various collecting stations in the Central Desert of Baja California, Mexico, during June, July and August, 1969. See Fig. 2 for explanation of figures.

plants may serve to delimit the coastal area of the Central Desert.

As noted by McGinnies *et al.* (1968), evaporation retards heating of the soil and vegetation, and may eliminate or reduce excessive heat loads, or it may keep the plant temperature below that required for optimum growth. This factor, concomitant with the temperature stabilizing effect of the ocean itself and the prevalence of strong, prevailing onshore winds, may be important in maintaining a distinction between the east and west coast floras.

The Pacific coast of Baja California as far south as Bahía Magdalena, with a mean January temperature above 18°C (64.4°F) and a subtropical climate, receives its maximum precipitation in winter (December-February), with the Central Desert receiving a winter average of 56mm (Hastings and Turner, 1965a). Winter storms generally cover a large area, are relatively gentle and may persist for days. But only in that area north of the Central Desert, the approximate southern limit of the Sierra San Pedro Mártir, do surface and ground water occur with any regularity. Near the coastal strand, the only surface waters encountered that were readily accessible to wildlife were the springs of San Felipe (Fig. 5) and Las Palomas, a small stream in San Javier Arroyo (Fig. 6), and numerous "tinajas" or tanks in the gulches and small canyons of the foothills.

Precipitation in fall (September-November), spring (March-May) and summer (June-August), in that order, is progressively less. In summer, when relative humidity tends to be low, rainfall is limited to thunder storms which are localized, relatively intense and of short duration. Rainfall from such storms was experienced on 24 June and 24 August.

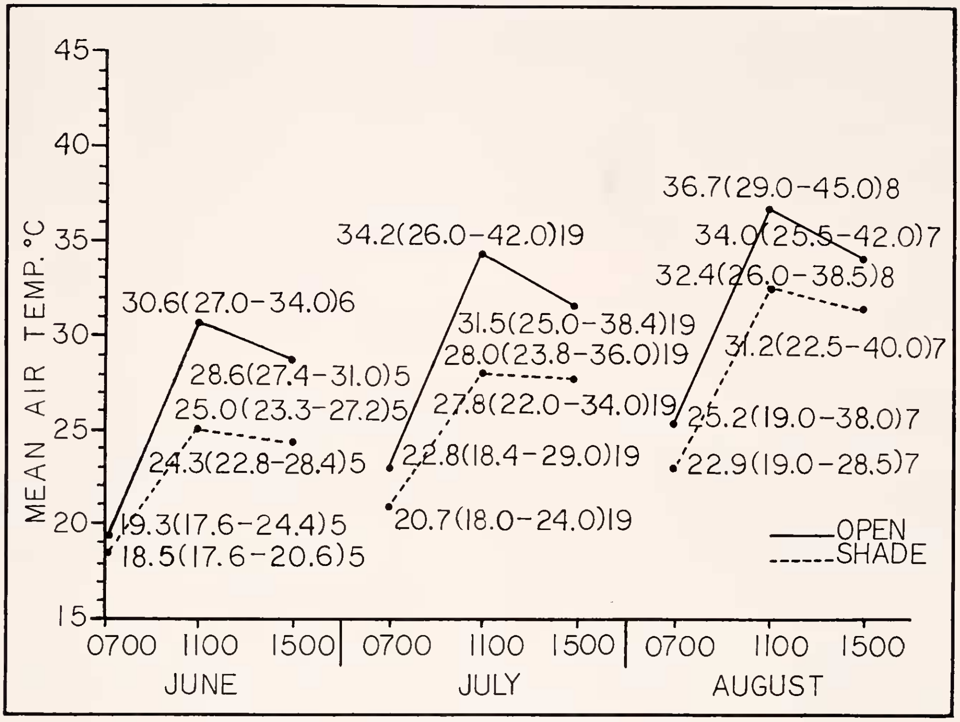

Figure 4. The mean air temperatures recorded at various collecting stations in the Central Desert of Baja California, Mexico, during June, July and August, 1969. See Fig. 2 for explanation of figures.

Combined mean monthly temperature data (taken from Hastings and Humphrey, 1969) from five coastal strand localities (El Rosario, Rosarito, Vizcaino, Bahía Tortuga and Punta Abreojos) within the Central Desert and less than ten miles from the ocean show that the highest mean monthly temperatures occur in August and September (ca. 24.2°C) and the lowest in January and February (ca. 15.7°C), but less than 8.5°C separate the mean temperature of winter and summer.

Diurnal fluctuations in the summer soil and air temperatures recorded during the survey are shown in Figures 3 and 4. In general, soil and air temperatures rose rapidly in the morning with the dissipation of coastal cloud or fog cover, peaked near mid-afternoon, and thereafter showed a gradual decrease. Shade temperature decreased less rapidly than temperatures in the open, and rose gradually from 1100 through 1500 in June and July.

VEGETATION

The survey area falls within Wiggins' (1960b) Central Desert phytogeographic area, specifically in the district of the Vizcaino Desert Subflora.

Characteristically, vegetation of the open coastal strand is stunted, seldom over one meter high, widely spaced, and lacking in species diversity. According to Wiggins (1960b) and Aschmann (1959) these characteristics are partially the result of strong, almost continuous onshore winds that release very little moisture in their passage. In areas protected from the direct effects of prevailing winds but still within reach of the fog and moist sea air, in sandy arroyo floors where the water table is near the surface, and in areas where runoff concentrates at the base of slopes, the vegetation is fairly abundant. The most conspicuous perennial plants of the Central Desert listed by Wiggins (1960b), Shreve and Wiggins (1964), and Aschmann (1959), included the following: *Agave* spp., *Ambrosia chenopodiifolia, Ambrosia magdalenae, Yucca valida, Idria columnaris, Machaerocereus gummosus, Larrea divaricata, Lycium californicum, Atriplex polycarpa, Viguiera deltoidea, Dudleya* spp., *Encelia* spp., *Euphorbia* spp., *Opuntia cholla, Viscainoa geniculata, Pachycereus pringlei, Lophocereus schottii, Echinocereus brandegeei, Fouquieria splendens, Prosopis* spp., *Cercidium* spp., *Solanum* spp., and *Pachycormus discolor.*

Also common in appropriate coastal strand habitats were *Frankenia palmeri, Atriplex canescens* and *Atriplex julacea.*[1]

SPECIES ACCOUNT

AMPHIBIANS

Bufo punctatus

Each evening at San Javier Arroyo (Fig. 6) trilling choruses of toads were audible. On the evening of 14 July several pairs were observed in amplexus along a 100 meter stretch of a stagnant stream. The tadpoles, with well-developed hindlimbs, were collected from a small, shallow, algae-covered pool. A total of 83 specimens (65 adults, 18 tadpoles) were taken at Station 38.

Hyla regilla deserticola

Ten adults and two tadpoles of this race (see Jameson *et al.*, 1966, for distribution and characters) were collected at San Felipe Springs (Sta. 8; Fig. 5), a small perennial spring marked by luxuriant vegetation consisting of cottonwoods, willows, fan palms, cirio, pitahaya and tules. The adults were found beneath rocks and in the grass and tules surrounding the main body of water, a shallow pond about five meters wide. The tadpoles were collected in another small pool.

Twenty-five adults were collected from rock crevices and from beneath rocks flanking the stagnant San Javier stream (Sta. 38, Fig. 6). Adults called late into the evening.

LIZARDS

Callisaurus draconoides crinitus

These lizards were confined to a coastal (Sta. 40; 8 specimens) and inland (Sta. 41; 28 specimens) sand dune habitat. Many individuals were approached within several feet and collected by stunning them with six-inch rubberbands.

Nine of the 18 females collected between 15-17 July had yolk-laden ovarian ova greater than 3mm in diameter, and four of the 18 contained oviducal ova. The mean length and width of ovarian ova in the left and right ovaries were 5.6(3.3-9.5)11 by 4.9(2.8-8.7)11 and 6.2(4.7-9.0)9 by 5.7(4.5-7.8)9, respectively. Oviducal ova in the left oviduct measured 15.2(14.0-16.7)3 by 8.0(7.4-8.7)3 and in the right oviduct 15.1(13.7-17.8)7 by 9.2(7.3-11.0)7.

Male *crinitus* average longer than females; mean lengths for 18 males and 18 females being 68.4mm (range 47-82mm) and 59.9mm (range 46-68mm). The mean testis size of the series collected in mid-July was 4.6mm(range 3.2-5.8mm) by 3.1mm(range 2.4-4.0mm). The right testis was anterior to the left in all males examined.

Measurements and counts of *crinitus* are summarized in Table 3. The distance between the anterior edge of the most anterior ventral tail bar and the posterior margin of the anus, a

[1]A list of other dominant plants representative of the major herpetological collecting stations in this area, is filed with the National Auxiliary Publication Service of the American Society for Information Service, and may be obtained by ordering NAPS Document 01547 from ASIS National Auxiliary Publication Service, CCM Information Corp., 909 Third Ave., New York, N.Y. 10022, remitting $5 per photocopy or $2 per microfiche copy.

measurement suggested by Dr. Benjamin Banta, readily separates *crinitus* from *rhodostictus* and appears to be much more reliable than the diagnostic characters used previously to separate these races (see Tevis, 1944). The number of oblique lateral bars was variable among the 35 *crinitus* examined; nine had none; three had two, two had four, and 21 had the three characteristic of the race.

Except for snout-vent length, the only important sex difference was the hindlimb length: males, 63.7(47-75)18, females, 55.2(45-64)18. Also, females tended to lack the oblique body bars more frequently than males; eight females out of the 18 had none, whereas only one of 17 males lacked the bars entirely.

Callisaurus draconoides rhodostictus

Individuals of *rhodostictus* were generally confined to sandy washes and broad, sandy arroyos. At the most inland collecting stations, where the soil is largely decomposed granite,

Figure 5. Station 8, San Felipe Springs (in arroyo de San Fernando), about nine miles NE of the arroyo-coastal road junction. Several adult *Hyla regilla deserticola* were collected beneath rocks and in the grass and tules surrounding the main body of water (see arrow); tadpoles were collected in another small pool of water not visible in photograph.

Table 3. Measurements and counts of *Callisaurus draconoides crinitus* and *C. d. rhodostictus*.

	crinitus	*rhodostictus*
Snout-vent length	64.1(46-82)36 S.D. = 9.9	68.9(38-85)29 S.D. = 9.8
Ratio, tail: total length	5.7(5-6)19 S.D. = 0.4	5.8(4-6)14 S.D. = 0.6
Distance between anus to most anterior ventral tail bar	15.9(7-26)34 S.D. = 5.2	3.4(1-7)29 S.D. = 1.5
Hindlimb length	59.4(45-75)36 S.D. = 8.7	64.5(32-84)17 S.D. = 8.9
Ventral body bars	2.2(0-4)35 S.D. = 1.3	1.8(0-2)29 S.D. = 0.6
Ventral tail bars	6.8(0-10)20 S.D. = 1.8	7.6(4-10)30 S.D. = 1.4
Femoral pores[1]	18.2(14-22)35 S.D. = 1.6	13.8(11-18)27 S.D. = 1.6

[1]Femoral pores counted on one side only.

rhodosticus were often observed basking during mid-day atop small rocks.

Only four of the 17 female *rhodostictus* collected had enlarged yolk-laden ovarian ova, [mean size: 5.3(3.2-6.9)12 by 4.8(3.2-6.0)12], and none had oviducal eggs. The specimens with enlarged ovarian ova were collected in late August, whereas the *crinitus*, four of which had oviducal ova, were collected in mid-July. This suggests that egg laying among *crinitus* and *rhodostictus* ceases between the end of July and August in the Central Desert.

Males tend to be larger than females; males had a mean snout-vent length of 75.3(61-85)12 and females a mean snout-vent length of 64.3(38-75)17. The testes of eight *rhodostictus* averaged 4.8(3.5-6.8)15 by 3.3(2.0-4.5)15. The right testes was anterior to the left in all males examined, and was usually slightly larger.

Other counts and measurements for *rhodostictus* are presented in Table 3. The mean hindlimb length, 76.1(61-84)12 for males and 64.5(32-72)17 for females, and the mean snout-vent length, previously mentioned, were the only apparent quantitative differences between the sexes. Specimens were collected at Stations 10 (4 specimens), 11 (1), 12 (2), 13 (2), 14 (3), 15 (1), 16 (1), 17(3), 18 (4), 19 (1), 26 (4), 31 (3).

Cnemidophorus hyperythrus schmidti

Walker and Taylor (1968) in their preliminary treatment of the geographical variation among the "*hyperythrus*-like" populations of Baja California lacked sufficient material from Central Baja California to determine the variation and distribution of *schmidti*. The specimens collected in this study possess a single mid-dorsal line, forked anteriorly, which is characteristic of *schmidti* (Lindsdale, 1932; Murray, 1955). Data concerning scutellation and pattern of those specimens are summarized and compared to similar data for *hyperythrus* and *beldingi* in Table 4.

Murray (1955) indicated that *schmidti* could readily be distinguished from *hyperythrus*, the southern race, by the arrangement of the mid-dorsal lines. Separation of *schmidti* from *beldingi*, the northern population, is based presently on the number of supraoculars separated from the frontal by granules and less consistently by the presence of two mid-dorsal stripes (Table 4). My data concerning the degree to which the supraoculars are separated from the frontal by granules show that this character is of little diagnostic value when considered alone (Table 4). An apparent diagnostic difference among the three populations is the number of granules around mid-body, intermediate in *schmidti* (Table 4).

Murray (1955) stated that intergradation between *schmidti* and *beldingi* probably occurs in the vicinity of El Mármol [about 45 miles NW of Laguna Chapala (Fig. 1)], because individuals suggestive of intergradation have been recorded from Laguna Chapala and Cataviñá (about 30 miles NW of Laguna Chapala). Murray's primary criterion was the partial or complete separation of the second supraoculars by granules. The Cataviñá specimen (see Lindsdale, 1932) was reported by Murray to be the only one from this part of the peninsula in which the second supraoculars were entirely separated by granules. I collected 15 individuals from Stations 2 through 38 (Table 1 and Fig. 1) that show this same condition. One of these specimens (45554) from Station 38, about 125 miles to the south of El Mármol, also has two mid-dorsal lines, more suggestive of *beldingi* than either of the specimens discussed by Murray (1955). Specimens were collected at Stations 5 (1), 6 (2), 7 (1), 8 (3) 15 (1), 26 (15), 31 (16), 34 (1), 36 (10), 38 (3).

Cnemidophorus labialis

Specimens of *C. labialis* from the localities below fill the distributional gap of 185 miles between Miller's Landing and El Consuelo. Station 41, 30 miles south of Miller's Landing, is the southernmost collecting locality, and probably is near the species southern limit.

Table 4. Variation in scutellation and patterns among Baja California races of *Cnemidophorus hyperythrus.*

	beldingi	*schmidti*	*hyperythrus*
Granules around midbody	72.8±0.8(66-79)17[1] S.D. = 3.3	75.2±0.6(66-83)54 S.D. = 4.1	77.6±0.8(69-90)45[1] S.D. = 5.2
Granules separating dorsolateral stripes	25.4±0.4(23-30)17[1] S.D. = 1.5	24.2±0.3(21-29)53 S.D. = 1.5	
Femoral pores (combined count)	31.9±0.5(29-37)17[1] S.D. = 2.2	31.5±0.4(26-39)52 S.D. = 2.6	33.6±0.4(29-41)44[1] S.D. = 2.6
Supraoculars (left-right)	3-4(2)[1],4-4(15)[1]	3-3(4),4-3(1),4-4(53)	3-3(16),3-4(3) 4-4(26),5-4(1)[1]
Anteriormost supraoculars separated from the frontal by granules:			
Part of third	5[4]	10[2] 19	28[3]
Third		48[2] 14	44[3]
Part of second	25[4]	3[2] 16	4[3]
Second	36[4]	15	
Frontoparietal			
Single	17	55	47[1]
Partially divided		5	
Divided			
Number of mid-dorsal lines			
Three	9[5]		48[2]
Two	104[5]	2[2] 3	15[2]
One forked anteriorly	46[5](extent of forking, if present, not stated.)		
More than one-third length		22[2] 10	
Less than one-third length		37[2] 46	3[2]

[1]Data from Walker and Taylor (1968)
[2]Data from Lindsdale (1932)
[3]Combined data from Murray (1955) and Lindsdale (1932)
[4]Data from Van Denburgh (1922)
[5]Data from Burt (1931)

The specimens, all adults, showed a daily activity cycle and occupied habitats similar to those previously recorded for the species (Bostic, 1968).

Scutellation and counts for Central Desert specimens were as follows: granules around mid-body, 59.8±0.4(52-69)87; granules separating paravertebral stripes, 8.4±0.1(6-12)89; femoral pore scales, left, 13.6±0.1(11-16)87, right, 13.5±0.1(11-16)78. Specimens were taken at Stations 2 (5), 26 (28), 28 (4), 31 (3), 33 (3), 36 (15), 37 (2), 41 (38).

Figure 6. Station 38, San Javier Arroyo. Several *Bufo punctatus* tadpoles were collected from the small, shallow algae-covered pool of water in the foreground. Adult *B. punctatus* were particularly abundant, and many were observed in amplexus. A *Sauromalus australis* was collected from within a crevice of the granite-strewn west slope (see arrow). *Phyllodactylus xanti sloani* were also collected beneath the exfoliating slabs of granite rock.

Cnemidophorus tigris multiscutatus

This species was relatively common throughout the survey area, but difficult to collect. Individuals were most active during the mid-day hours, when they were frequently observed foraging from shrub to shrub. They preferred the soft soil (sand and decomposed granite) of the washes and arroyos to the compacted, rocky soil of the marine terraces.

Selected characters for the specimens collected are as follows: Postantebrachials granular in all but three individuals, which have these slightly enlarged; supraorbital semi-circles normal, except for two specimens in which they extend past the posterior margin of the frontal; anterior nasal not in contact with the second supralabial in all but eight lizards; fronto-parietal divided in all but one specimen; number of supraoculars 4-4, except for seven specimens which have 5-5, 4-5, or 4-3 supraoculars; granules around body, 90.6±0.7(82-104)48; femoral pore scales (left), 20.0±0.2(17-23)69, S.D. 1.51; femoral pore scales (right), 19.9±0.2(16-23)70, S.D. 1.58. Specimens were obtained at Stations 2 (1), 5 (4), 8 (11), 9 (2), 15 (1), 16 (1), 18 (1), 19 (1), 20 (13), 21 (2), 26 (14), 31 (8), 33 (2), 36 (8), 38 (2).

Coleonyx variegatus abbotti

These specimens agree closely with Klauber's (1945) original description, confirm the presence of the race in the Central Desert, and support Klauber's (1945) tentative assignment of a damaged specimen at Calmallí, seven miles NW of El Arco, to this subspecies. One individual was found beneath a small slab of shale on the SW slope of a clay-like foothill (Sta. 1), and two were collected beneath the basal leaves of dead *Agave* at Station 38.

Crotaphytus collaris

One speciment from Station 20, an adult male, represents the first recorded occurrence of *Crotaphytus collaris* west of the peninsular divide (Van Denburgh, 1922: 109; Smith and Taylor, 1950: 92).

The collecting station, Mesa de San Carlos, is a broad table-topped mountain near the coast, which rises to an altitude of from 422 to 739 meters. The above individual was observed foraging among large basaltic rocks on the edge of the mesa at approximately 1400 hrs. Another *C. collaris* was observed basking at 1730 hrs. on a small rock, part of a large basaltic rock outcrop, surrounded by low shrubs on the mesa proper.

Crotaphytus wislizeni copeii

A single juvenile from Station 20 agrees in scutellation and pattern with Banta and Tanner's (1968) account of the race. It was foraging in the late afternoon in a sandy wash thickly overgrown with xeric vegetation.

Gerrhonotus multicarinatus ssp.

Table 5 shows that the Central Desert specimens agree closely with *G. paucicarinatus* in degree of keeling and in some details of pigmentation. They appear more like *G. m. webbi* in numbers of longitudinal dorsal scale rows, and dorsal pattern; they have an intermediate position between *paucicarinatus* and *webbi* in numbers of transverse dorsal scale rows, degree of keeling and numbers of keeled temporal scale rows, lateral fold pigmentation and ventral markings. Coloration and over-all pattern among the individuals show considerable variation. Some resemble *paucicarinatus* and others *webbi.* Individual counts and measurements of the Central Desert specimens appear in Tables 6 and 7.

The above evidence suggests intergradation between *G. paucicarinatus* and *G. multicarinatus.* However, since a gap of about 250 miles separates these populations, it would be premature to make a formal nomenclatural change at this time.

The Pacific coastal strand is suitable for the southern dispersal of *G. multicarinatus.* Similarly, *G. paucicarinatus,* once believed to occur only in the highland area of the Cape Region, has now been recorded in the lowland area of the Cape (Richmond, 1965), and may have dispersed farther northward along the Pacific Coast where cool, moist environments suitable for anguids prevail.

Savage (1960) surmised that *paucicarinatus* separated from *multicarinatus* during a Pleistocene glacial maximum, but whether this isolation has resulted in ecological and/or reproductive isolation is unknown. The Vizcaino Desert is a possible barrier preventing their contact. From here south through the Magdelena Plains region, coastal precipitation is unpredictable, and often a summer phenomenon.

These specimens together with a specimen of *G. multicarinatus* ssp. from the Pacific coast west of Punta Prieta (Bogert and Porter, 1967: 15) are the first of *Gerrhonotus* from the Central Desert. Six were collected beneath dead or partially dead *Agave,* and two beneath pieces of tin at the abandoned settlement of Las Palomas. None of the examined females, collected in July, had enlarged yolk-laden ova or oviducal ova, but the oviducts in all were highly vascularized and convoluted.

Specimens were obtained at Stations 31 (1), 33 (3), 36 (3), and 38 (1). Additional specimens examined—two *G. multicarinatus* ssp. [SDSNH 45016, 24 December 1969, Sta. 31; American Museum of National History (AMNH) 75765, 22 April 1956, 5 mi. NE of Punta Santa Rosalia]; 18 *G. paucicarinatus* from the Cape Region of Baja California (SDSNH 45006-45010, 45033, 45095-45098, 45100-45101, 45103-45106, 53057-53058).

Table 5. Comparisons between adult *Gerrhonotus paucicarinatus, G. multicarinatus* ssp., and *G. multicarinatus webbi.*

Character	*G. paucicarinatus*	*G. m.* ssp.	*G. m. webbi*[2]
Average Snout-vent length	130	94.6	135(n = 35)
Scutellation			
Dorsal Scale Rows			
Transverse	50.7(50-51)10[1] 50.1(46-54)18	46.2(45-50)9	41.5(38-45)44
Longitudinal	15.4(14,16)10[1] 16.2(16,18)18	14	14
Ventral Scale Rows			
Transverse	62.7(60-64)10[1] 64.1(60-67)18	64.6(62-68)9	63.2(60-66)44
Longitudinal	12[1] 12.1(12,14)18	12	12
Keeling			
Temporals	None	Upper one to two rows faint or none.	Upper two rows or more.
Dorsal Rows	11.2(8-12)18	11.4(10-14)9	14
Upper Arm	None	None	Three rows or more.
Lower Arm	None	None	Average 2.8[3]
Tail	6-8	6-10	Eight plus several lateral rows.
Pigmentation			
Dorsal Head Spotting	Present (distinct)	Present (distinct-faint)	Absent (normally)
Eye Color	Unknown to me.	Yellow	Yellow
Temporal Eye Stripe	Distinct	Distinct	Faint
Labials	Normally distinctly banded with alternate black and white markings.	Faintly to distinctly edged with black.	Unicolor or the supralabials may be faintly edged with black.
Body Bands	11.1(n = 10) when complete, but often bands are incomplete dorsolaterally. White markings are reduced laterally and usually absent mid-dorsally.	11.1(10-14)9; Moderately indented with white markings on fifth or sixth scale row above lateral fold. The white mid-dorsally is usually indistinct.	10.6(9-13)38; deeply indented with distinct white markings on fifth scale row above lateral fold and in middle of back.
Lateral Fold	Ground color predominates with narrow black lines.	Ground color predominates with large whitish spots distinctly outlined and composed of groups of white scales; black markings when present faintly diffuse.	Ground color predominates with scattered white spots but no black markings.
Ventral Markings	Along middle of longitudinal scale rows forming distinct longitudinal lines in most.	Along middle of longitudinal scale rows forming distinct to faint longitudinal lines.	Along middle of longitudinal scale rows forming faint longitudinal lines in most.

[1]From Fitch (1938) [2]From Fitch (1938) except where noted. [3]From Murray (1955)

Table 6. Counts of body scales and cross bands in *Gerrhonotus multicarinatus* ssp. from the Central Desert.

Catalogue No.	Dorsal Scale Rows		Number Keeled	Ventral Scale Rows		Cross Bands[1]
	Transverse	Longitudinal		Transverse	Longitudinal	
45992	45	14	12	64	12	10
45993	47	14	14	65	12	11
45994	45	14	12	66	12	10
45995	47	14	12	62	12	14
45996	45	14	10	64	12	10
45997	50	14	11	68	12	11
45998	47	14	10	63	12	10
45999	45	14	10	65	12	12
46016	45	14	12	64	12	12

[1]Partial bands not counted

Table 7. Measurements of *Gerrhonotus multicarinatus* ssp. from the Central Desert.

Catalogue No.	Sex	Collecting Station[2]	Date	Snout to vent[1]	Tail	Head		
						Width	Length	Depth
45992	M	31	1 July 1969	98	Broken	14.0	20.0	9.6
46016	M	31	24 Dec. 1969	87	Regenerated	12.4[1]	19.3[1]	9.0[1]
45993	M	33	6 July 1969	104	Broken	16.5	21.0	12.0
45994	M	33	7 July 1969	92	Broken	13.3	19.0	9.0
45995	M	33	7 July 1969	100	150 (79 whorls)	14.6	20.9	11.0
45996	F	36	9 July 1969	92	Regenerated	11.5	17.8	9.8
45997	F	36	10 July 1969	79	Regenerated	10.9	15.6	6.6
45998	M	36	10 July 1969	107	Regenerated	17.6	23.4	11.0
45999	F	38	14 July 1969	92	Broken	12.6	17.9	9.0

[1]Measurements before preservation
[2]See Table 1

Petrosaurus repens

The 10 specimens from Station 10 are the first known from the west coast of Baja California del Norte. They were initially observed basking on huge granitic boulders between 1500 and 1830 hrs. When disturbed they usually sought refuge deep within rock fissures. Two individuals were smoked out and hand captured.

None of the eight females collected on 27 August had enlarged (>3mm), yolk-laden ovarian or oviducal ova. All the stomachs examined contained small black seeds similar in appearance to those in the fruits of the barrel and fishhook cacti which occurred commonly in the area. Many of the stomachs also contained small amounts of other nondescript vegetation and all contained the carapaces of small beetles.

Scutellation and measurements of the specimens collected are as follows: snout-vent length, 94.7±5.3(78-111)6,S.D. = 13.0; head width, 16.7±0.8(14.2-19.6)7,S.D. = 2.0; femoral pore scales (combined count), 24.8±0.4(22-26)8,S.D. = 1.2; dorsals 172.4±2.2(165-182)7,S.D. = 5.8; head ventrals, 69.3±2.1(63-77)7,S.D. = 5.6; fourth toe lamellae, 27.5±0.3(26-28)8,S.D. = 0.7.

Phrynosoma coronatum

Two active specimens were collected on a flat, sandy substrate sparsely covered with low shrubs, and one was collected at 0650 hrs. by raking the sand beneath a hummock covered with ragweed; it was relatively sluggish and made no attempt to elude capture. These specimens were taken at Stations 9 (1), 14 (1), and 41 (1).

Phyllodactylus xanti sloani new subspecies

Holotype.—Adult female (Fig. 7), SDSNH 45895, collected 23.5 miles SE of El Rosario (29°48′N, 115°33′W), Baja California del Norte, Mexico, from a crevice in a block of shale by Thomas Cozens on 31 March 1969.

Paratypes.—All seventeen paratypes collected are from Baja California del Norte, Mexico: SDSNH 45896, Sta. 9; SDSNH 45897-45898, Sta. 25; SDSNH 45899-45900, Sta. 26; SDSNH 45901-45907, Sta. 31; SDSNH 45908, Sta. 33; SDSNH 45909-45912, Sta. 38.

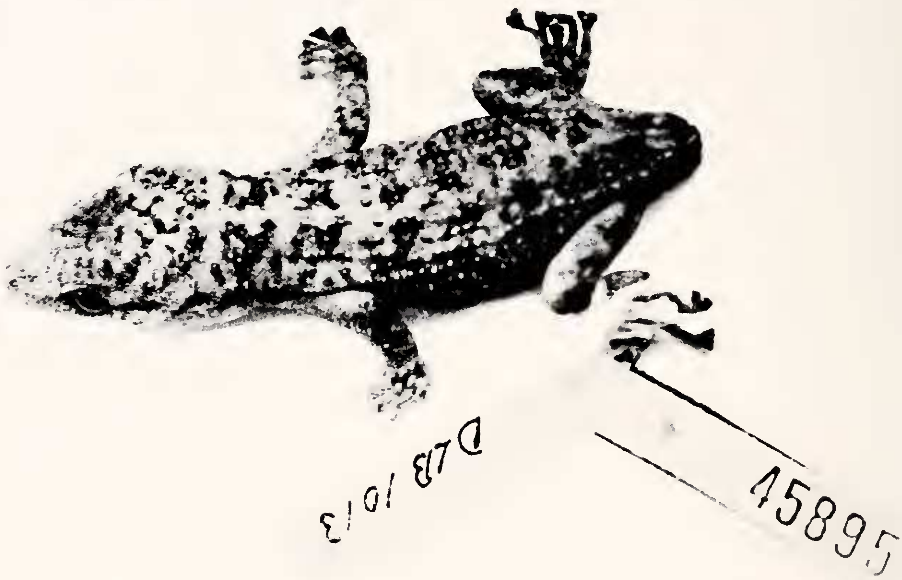

Figure 7. Holotype (SDSNH 45895) of *Phyllodactylus xanti sloani.*

Diagnosis.—This race differs from all other races, except *nocticolus,* confined to southeastern California and the eastern desert regions of Baja California, and *angulus,* occurring on Islas Salsipuedes and San Lorenzo Island, Gulf of California, by the absence of thigh tubercles (see Dixon, 1969:79.1-79.2, for diagnostic accounts of the races of *P. xanti*); from *angulus* in larger snout-vent length (51.1mm vs. 43.8mm), less numerous mid-orbital scales (18.0 vs. 20.5) and fewer paravertebral tubercles from axilla to groin (20.4 vs. 23.0) and from rear of head to base of tail (37.8 vs. 40.0); from *nocticolus* in less numerous longitudinal rows of ventral scales (27.2 vs. 35.2) and fewer tubercles in a paravertebral row between axilla and groin (20.4 vs. 23.0).

Description of holotype.—Rostral twice as wide as high, its dorsal edge with two rectangular internasals, their median edges in broad contact, bordered posteriorly by five granules and postnasal on each side; nostril surrounded by rostral, internasal, labial, and two postnasals; its ventral edge in contact with labial; slight depression between internasals and in frontal region; 20 scales between eye and nostril; posterior dorsolateral loreals three to four times larger than interorbital scales; 15 scales across snout between second labials, 17 between third labials; 12 scales between anterior edge of orbits; 20 interorbital scales; eye large, contained in snout length approximately one and one-half times; eyelid with two rows of granules and one larger outer row of scales, the latter with seven posterior scales bearing spines; diameter of ear contained in diameter of eye slightly less than two times; ear opening not denticulate, anterior border with rounded and slightly pointed scales, posterior margin with smaller rounded scales; top and rear of head granular, with faintly keeled, larger, intermixed tubercles; 12 supralabials, seventh to center of eye; 11 infralabials, fifth to center of eye; mental lyre-shaped, length and width equal; postmentals followed by a transverse row of eight scales, followed by a second row of 12 smaller scales; postmentals contacting first labial on right and left sides.

Dorsum with 12 longitudinal rows of enlarged, keeled, somewhat flattened tubercles, 11 rows reaching head, six at base of tail; 39 paravertebral tubercles, 24 between axilla and groin; two median rows of enlarged tubercles separated from each other by two and three rows of granules; each tubercle of enlarged dorsal series separated from proceeding tubercle by one to three granules; three postanal tubercles on either side of anus, well differentiated, rounded; 35 scales across venter, 72 from gular region to anus.

Ventral, antero-dorsal surfaces of limbs with large circular scales, postero-ventral surfaces granular; lower arm and leg granular, with scattered larger, keeled tubercles intermixed; lamellae formula for left hand 7-9-10-11-8 (undivided 2-6-7-8-7), left foot 6-10-12-13-11 (undivided 5-8-8-12-6); claws short, tip barely visible when viewed from below; terminal pads rounded at tips; tail missing.

Measurements in mm.—Snout-vent length 53; headwidth 10.7; head length 13.9; axilla-groin length 24.4.

Color in alcohol.—Mid-dorsum ground color pinkish-tan; dorso-lateral surfaces blue-gray. Venter light pinkish-tan; dorsum with six reddish-brown broken crossbands, slightly narrower than ground color interspaces; dorsal and lateral surfaces of head spotted with light brown; area posterior of eye orbits, but anterior to first dorsal band, spotted with light brown on a tan ground color; dorsal surfaces of limbs with brown spots; tips of enlarged dorsal tubercles cream, brown, or brown and cream.

Variation.—No sexual dimorphism in size, color, or pattern is evident. Counts and measurements are as follows: Snout-vent length 51.1±0.6(32-61)17; enlarged series of dorsal tubercles, 11.8±0.3(9-14)17; postmental border scales, 7.3±0.2(6-10)18; nostril to eye scales, 10.5±0.2(9-12)18; scales bordering internasals, 6.8±0.1(5-8)18; interorbital scales, 18.0±0.3(15-20)18; third labial scales, 16.4±0.2(15-18)18; lamellae beneath fourth toe, 12.5±0.2(11-14)18; scales across venter, 27.1±0.9(21-35)17; number of paravertebral tubercles, 37.8±0.7(32-40)17; axilla to groin, 20.4±0.3(17-24)16. Of the 18 specimens, all but one have the postmentals contacting two labials on each side. There are two postmentals in all but two individuals, which have three. The number of interorbital scales is always equal to or more than the number of scales across the snout between third labials. The color pattern varies from incomplete, irregular bands, and spotting to complete bands on the dorsum (Fig. 8). The ground color ranges from reddish-brown to gray-brown. The venter of all specimens is immaculate.

Remarks.—These specimens are the first of *P. xanti* from the Pacific slope of the peninsula (see Dixon, 1966, Fig. 1). All individuals were collected beneath exfoliating slabs and in fracture crevices of granite and shale, predominately the latter (see Fig. 6). This subspecific epithet honors Allan J. Sloan, Curator of Reptiles and Amphibians, San Diego Museum of Natural History, whose assistance, enthusiasm and support were largely responsible for making this survey a reality.

Range.—Known from 23.5 miles SE of El Rosario (29°48′N, 115°33′W) to San Javier

(28°32′N, 114°05′W) on the west coast of the peninsula.

Specimens examined.—The 18 specimens examined are listed under type and paratypes.

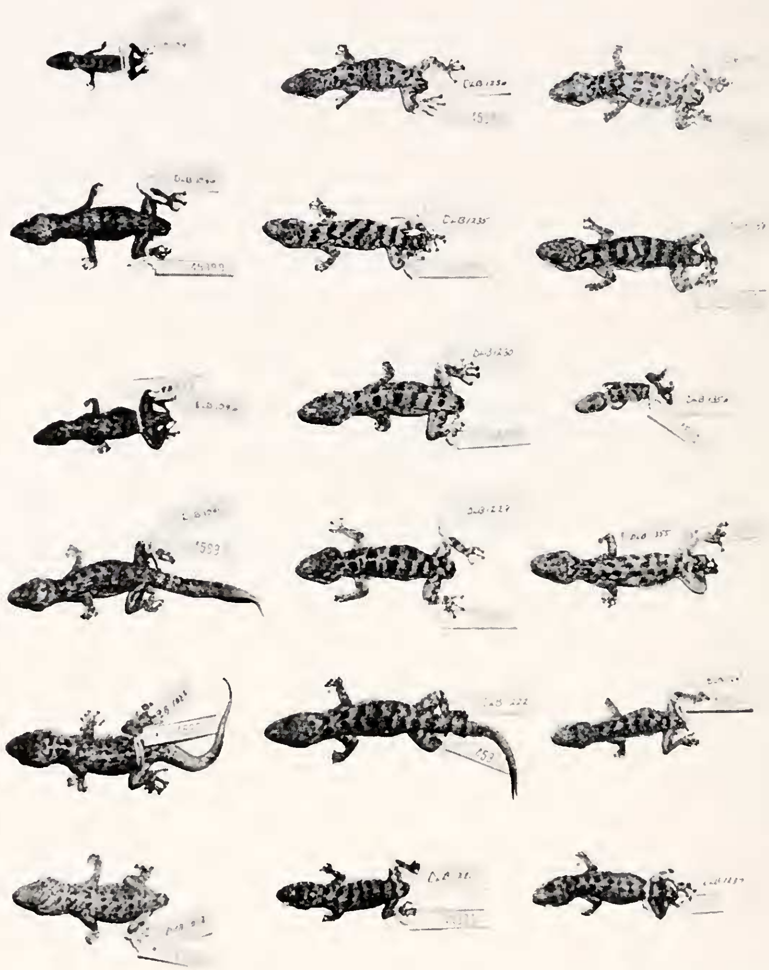

Figure 8. Dorsal variation among specimens of *Phyllodactylus xanti sloani* collected along the Pacific coastal strand of the Central Desert of Baja California del Norte, Mexico.

Sauromalus australis

An adult male was collected from deep within a crevice on the afternoon of 12 July 1969 approximately 15 yards up the steep granite-strewn west slope of Arroyo San Javier (Station 38; see Fig. 6).

Despite two additional days working suitable habitats in and around the arroyo, no other *Sauromalus* were observed. That this specimen was not a "waif," however, was indicated by large amounts of dried fecal material, and by the observation of similar large lizards by a resident rancher, Señor Lopez of "Mi Ranchita," who stated that chuckwallas could be found about three miles to the east of his ranch.

Undoubtedly more chuckwallas will be collected in this area during a more favorable time of year, spring and early summer, when plant food is available and the daily temperature not so high. I suspect that most *Sauromalus* in this region undergo a state of estivation deep within granitic fissures when the vegetation is dormant. Plant food was also decreased in and around Arroyo San Javier by domestic goats. Johnson (1965) noted that almost all activity of a Mojave Desert population of *Sauromalus obesus* ceased by 1 August owing to a lack of food and water.

This specimen, the first collected on the Pacific side of the Peninsula, fits the parameters of scutellation and measurements established for the species by Shaw (1945).

The pattern and coloration of this species differ from those described for the type specimen by Shaw (1945). In pattern it is like one (SDSNH 17708) he described from La Paz, and in coloration it is similar to *Sauromalus ater* in being yellowish-black (and brown) instead of the gray characteristic of *S. australis.*

Sceloporus magister rufidorsum

Sceloporus magister, difficult to collect, were most frequently associated with impenetrable thickets of thorn bush and pitahaya. At Station 33, a coastal sand dune habitat, they inhabited hummocks covered with tree sunflower (*Encelia ventorum*). Of the adults (snout-vent >93mm) collected, six were females and 13 were males, with 21 and 19 being juvenile female and male, respectively. Two females with snout-vent lengths of 90mm and 93mm contained a combined total of 13 oviducal eggs, the mean size of which was 18.0mm by 10.0mm (range 11.5mm-17.1mm by 8.8mm-12.0mm). The mean number of oviducal ova in the left and right oviducts was 2.5 and 4.0, respectively.

Phelan and Brattstrom (1955), in their analysis of the variation among *S. magister* populations, concluded that the basic differences are those of coloration of the adult males, scutellation characters being so variable that they were not significant.

Variations in scutellation and other measurements of the Central Desert specimens are compared (Table 8) to data provided by Phelan and Brattstrom (1955). Excluding the circumorbital and femoral pore counts, these data fit the parameters established by Phelan and Brattstrom for *S. m. rufidorsum.* The Central Desert specimens tend to have the circumorbital scales broken up into smaller units, which accounts for the greater range and mean. There was little consistency in color pattern among the Central Desert specimens. Of the 13 adult males examined only one had a typical *rufidorsum* pattern, six had a basic *rufidorsum* pattern but lacked side bars, five had a *lineatus* pattern, and one had no pattern (see Phelan and Brattstrom, 1955, Fig. 1). Adult females showed a similar variation in pattern; juveniles showed a much greater one.

In summary, dorsal patterns of adult males are so variable as to be of little diagnostic value. Consequently, I question the reliability of subspecific recognition based primarily on the dorsal pattern of adult males. Specimens were collected at Stations 2(2), 6(1), 12(1), 15(1), 16(1), 21(3), 26(10), 31(7), 33(5), 36(8), 37(2), 38(5), 40(1), 41(21).

Sceloporus orcutti orcutti

Seven individuals of *S. orcutti* were associated with large granitic rock outcrops, and one was collected from among the basal leaves of an *Agave* where it had traveled after it was first discovered in a thicket of thorn scrub.

Two of three females collected on 4 and 13 July contained a total of 14 oviducal eggs, the mean size of which was 15.4mm x 9.5mm (range 14.2-16.5mm x 9.1-10.1mm).

Scutellation and measurements for the specimens, five females and three males, taken at Stations 8(1), 10(3), 26(1), 31(1), and 38(2) are as follows: snout-vent length 83.8±4.3(67-102)8,S.D.=12.2; ratio, tail: snout-vent, 1.2±0.5(0.92-1.28)5,S.D.=0.1; dorsal scales 31.1±0.3(30-32)8,S.D.=0.8; femoral pores, 13.2±0.4(12-15)8,S.D.=1.1; gular scales,

Table 8. Scutellation and measurements of adult *Sceloporus magister rufidorsum*.

	Phelan and Brattstrom (1955)	Central Desert Specimens	
		Males	Females
Snout-vent length	131.0-maximum	110.0±2.1(97-119)12 S.D. = 7.4	96.2±1.7(93-105)6 S.D. = 4.2
Ratio, tail: snout-vent	1.4(1.2-1.5)6	1.2±0.03(1.0-1.4)12 S.D. = 0.1	1.3±0.04(1.2-1.3)6 S.D. = 0.1
Dorsal scales	29.8(29-31)8	29.0+0.2(28-30)11 S.D. = 0.7	29.3±0.5(28-30)3 S.D. = 0.9
Femoral pores	17.9(15-20)14	18.6±0.4(16.5-20.0)12 S.D. = 1.5	17.5±0.5(16-19)6 S.D. = 1.2
Gular scales	15.9(15-18)8	18.4±0.4(17-20)12 S.D. = 1.2	18.6±0.3(17-19)6 S.D. = 0.7
Supralabials	4.4(4-5)13	4.1±0.1(4.0-4.5)12 S.D. = 0.2	4.1±0.1(4.0-4.5)5 S.D. = 0.2
Infralabials	6.2(5-7)13	6.2±0.1(6.0-6.5)12 S.D. = 0.2	6.5±0.1(6.0-7.0)5 S.D. = 0.3
Supraoculars	5.3(5-6)13	5.5±0.2(5-6)5 S.D. = 0.4	5.7±0.9(5-6)5 S.D. = 0.4
Circumorbitals	5.1(3-6)14	6.9±0.4(6.0-10.5)12 S.D. = 1.3	8.1±0.9(5-11)5 S.D. = 2.0
Lamellae, fourth toe	————	22.7±0.4(20-25)12 S.D. = 1.4	22.3±0.3(21.0-23.5)6 S.D. = 0.8
Auricular lobules	————	5.5±0.2(4.5-6.0)12 S.D. = 0.7	5.5±0.3(4.5-6.0)5 S.D. = 0.6
Ventrals	————	39.1±0.8(35-43)11 S.D. = 2.6	40.2±0.6(39-42)6 S.D. = 1.4

16.8±0.4(15-18)8,S.D. = 1.0; infralabials, 5.8±0.1(5.5-6.0)8,S.D. = 0.4; supraoculars, 5.0±0.2(4-6)8,S.D. = 0.5; circumorbitals, 6.1±0.2(5.0-6.5)7,S.D. = 0.6; lamellae, fourth toe, 20.6±0.9(15-23)8,S.D. = 2.4; auricular lobules, 5.6±0.2(5-6)8,S.D. = 0.5; ventrals, 38.7±0.7(35-41)7,S.D. = 1.8.

Urosaurus microscutatus

All individuals were initially observed basking or foraging in rocky areas and when approached generally retreated to rock crevices. The collected specimens, from Stations 10(2), 20(1), 33(1) and 38(3), represent over half of all *Urosaurus* observed during the survey.

Uta stansburiana

Side-blotch lizards were the most frequently observed reptile in the Central Desert. They occupied every conceivable habitat, and were generally the first and last reptiles observed each day. Specimens were collected at Stations 2(14), 5(2), 6(1), 8(2), 9(6), 10(7), 14(1), 16(2), 18(1), 20(8), 21(16), 23(1), 24(3), 25(1), 26(19), 28(5), 29(1), 30(1), 31(10), 33(7), 36(5), 37(7), 38(4), 39(4), 40(3), and 41(46).

Xantusia vigilis wigginsi

This species was most commonly found beneath the basal leaves of dead *Agave* and less frequently in or under dead decaying stems of cirio and *Yucca*. Specimens were taken at stations 2(7), 5(4), 26(4), 31(8), 33(8), and 36(1).

These specimens fill the distributional gap of approximately 85 miles between the northermost collecting locality, 23.5 miles north of Punta Prieta, Baja California del Norte, recorded for this race (Savage, 1952), and a single specimen collected near El Rosario which

Savage stated seemed "to be nearer *wigginsi* than to the northern form," (*X. v. vigilis*).

SNAKES

Chilomeriscus cinctus

An adult male was collected at Station 38 by raking through the base of a small hummock of sand. A *Phrynosoma coronatum* and a *Sceloporus magister* were collected in the same fashion, but beneath the sand of a larger hummock covered with ragweed.

Counts and measurements for this individual are as follows: ventrals, 124; subcaudals, 25; dorsal body bands, 22; tail bands, 5; and dorsal scale rows, 15-15-13.

Crotalus enyo enyo

A juvenile specimen was collected at Station 3 beneath a dead *Agave.* Scutellation and pattern agree with Klauber's (1931b) account of the nominal race.

Crotalus ruber ruber

The number of body blotches and the scale counts of these specimens fall within the parameters established for the race by Klauber (1964: Table 2:7).

Crotalus ruber occupied a diversity of macrohabitats; one was observed in a coiled position about 10 yards above the high tide mark of a cobblestone beach and another in a coiled position beneath an ocotillo in bloom in a sandy, dune-like environment. Specimens were collected at Stations 2(1), 3(1), 6(1), 7(1), 8(1), 21(1), 22(1), 38(1), 41(1).

Crotalus viridis helleri

A juvenile specimen collected at Station 41 is distinctly light colored with a sharply defined pattern. It was observed at 0920 hrs. coiled beneath a small, sparsely branched ragweed shrub at the fringe of an isolated sandy dune area.

Details of pattern and scale counts agree with those summarized by Klauber (1964, Table 2:7) for the race.

Hypsiglena torquata klauberi

An active immature female was collected at 1710 hours beneath a dead *Agave* in an eroded, sandy-bottomed wash (Sta. 2). Scutellation, coloration and pattern are similar to those reported by Tanner (1944) for the race.

Lichanura roseofusca gracia

Compendia dealing with North America reptiles list two species of *Lichanura, trivirgata* and *roseofusca,* the latter species represented by two races, *roseofusca* and *gracia.*

Klauber (1933) reported a specimen of rosy boa from Guaymas, Sonora, Mexico, that agreed exactly with *L. trivirgata* in coloration and pattern but more closely approached *L. r. gracia* in scutellation. He remarked that perhaps we might be dealing with three subspecies, *trivigata, gracia* and *roseofusca.* However, he did not suggest uniting the two species before additional material between Guaymas and southern Arizona and in central Baja California demonstrated intergradation.

Since Klauber's (1933) remark, additional specimens have been collected from these areas, but according to Gorman (1965) we still lack a basis for uniting the two species of *Lichanura* in view of the great uniformity of pattern of *trivirgata* throughout its known range, and the absence of obvious intergrades with *gracia.*

The Central Desert specimen from Station 38 is of particular interest since the locality is the southernmost for *Lichanura* in Baja California del Norte, and is only 100 miles from San Ignacio, the northernmost for *L. trivirgata.*

The Central Desert specimens appear to agree with *trivirgata* in dorsal and ventral counts, but more closely agree with *gracia* in all other counts (Table 9). In pattern and coloration there is close agreement with Klauber's (1931a) description of *gracia* . I tentatively, then consider these specimens to be *gracia*.

One boa, a mature male, was collected in a grain field shortly after it had been killed by a rancher (Sta. 4), and the other, an active female, was collected in the late afternoon from beneath the basal leaves of an *Agave* (Sta. 38).

Table 9. Scale characters of *Lichanura trivirgata* and *L. roseofusca*.

	L. trivirgata		*L. roseofusca*[2]		Central Desert Specimens SDSNH Nos.	
	Gorman[1]	Klauber[2]	*gracia*	*roseofusca*	45957	45958
Dorsals	39.2(36-41)10	41.4(40-43)7	41.3(40-43)9	40.9(35-43)38	42	40
Ventrals	218.5(219-223)10	222.0(218-227)7	230.0(220-236)9	232.0(221-244)38	225	222
Caudals	45.0(42-49)10	44.0(42-46)7	46.0(42-49)9	47.0(39-51)38	46	43
Oculars	10.1(9-11)10	9.7(9-11)9	9.8(8-11)9	9.1(7-10)38	11-10	10
Supralabials	12.8(12-14)10	12.8(12-13)7	14.1(13-15)9	14.1(12-15)38	15	14
Infralabials	13.8(13-15)10	13.8(13-15)7	15.4(14-17)9	15.0(13-17)38	15	14-15

[1]Data from Gorman, 1965
[2]Data from Klauber, 1931

Masticophis flagellum piceus

Specimens, all adult females, were taken at Stations 2(1), 9(1), and 28(1). One active individual was collected from within the hollow, dead stalk of an *Agave* at 1655 hrs. Another was collected at 1500 hrs. from beneath a large shrub in a sandy, eroded arroyo. The most active individual was first observed in early afternoon foraging on the leeward side of a large inland sand dune.

Phyllorhynchus decurtatus decurtatus

An adult male was collected at approximately 2000 hrs. as it crossed a sandy stretch of road at Station 35. Scutellation and counts are as follows: caudal blotches, 7; dorsal body blotches, 39; ventrals, 168; caudals, 36; snout-vent length, 367; and tail length, 58.

Pituophis melanoleucus annectens

This adult female was killed by a farmer who saw it foraging in a grain field (Sta. 4).

Scutellation and other counts, except for the ratio of total length to tail length, fit the parameters established by Klauber (1946) for the race. The aforementioned ratio is .107 (total length 2565mm/tail length 265mm) considerably less than the .155 reported by Klauber (1946) for female *annectens*, which he states is probably the longest tailed of all the gopher snakes.

Pituophis melanoleucus bimaris

One specimen, an adult male from Sta. 21, was observed at 0930 hrs. as it foraged in a sandy area studded with pitahaya. It attempted to elude capture by retreating down a mammal hole. The other *bimaris*, an active, immature female from Station 33, was collected from beneath the basal leaves of a dead *Yucca* on a coastal foothill. This individual, as indicated by the bulge in its stomach, had recently fed on a small woodrat (*Neotoma*).

Salvadora hexalepis klauberi

One specimen was collected in late afternoon while basking on a dirt road (Sta. 5). The other individual was collected at 1630 hrs. as it foraged in an open sandy area (Sta. 36).

Scutellation, pattern and counts generally fit Klauber's (1946) description of the race. The exceptions are as follows: SDSNH 45953 has 241 ventrals, much lower than the range of 253-257 given by Klauber, and SDSNH 45954 has a tail-to-total-length ratio of

0.168, higher than the 0.140 reported by Klauber for the race.

Tantilla planiceps eiseni

A specimen, found dead on a sandy-dirt road adjacent to a flat sparsely vegetated sandy area (Sta. 5) is the fifth of *T. p. eiseni* from the peninsula (Tanner 1966) and the first of *Tantilla* from the Pacific side of central Baja California.

Scutellation and measurements of the specimen, an adult female, are as follows: ventrals, 176; caudals, 62; ventral-caudal total, 238; total length, 211; tail length, 30; ratio of tail to total length, 0.142. These counts and measurements, excluding tail to total length ratio, fall within the range recorded by Tanner (1966) for female *eiseni*; but the tail to total length ratio of 0.142 is considerably less than the range of 0.178-0.256 reported by Tanner. Pattern and coloration of the specimen fit Tanner's (1966) description of the subspecies.

DISCUSSION

This report treats 29 species of amphibians and reptiles from the Pacific coastal strand of Baja California del Norte's Central Desert, including elements from three Peninsular faunal zones; the Californian, the Colorado Desert District, and the Cape Region.

Only one species, *Cnemidophorus labialis*, may be considered to be endemic to the Central Desert, and only if one considers the coastal region between Arroyo Santo Tomás and 20 miles north of El Rosario to be Sonaran Desert. This area, based on the dominant forms and composition of the flora and fauna appears to be Sonoran Desert (Short and Crossin, 1967; Bostic, 1968). Since Shreve (1936) referred to this area as the Chaparral-Sonoran ecotone many workers have arbitrarily included it within the California faunal region.

The relative absence of endemic forms and the lack of species diversity support, in part, the theory that during periods of glacial maxima the deserts of the Peninsula were all but eliminated, and that reconstitution of the desert herpetofauna occurred during glacial minima (Savage, 1960).

Homogeneity of habitats and the moderate climate of the Pacific coastal strand have also been important factors in reducing species diversity. Savage (1960) listed 32 species of amphibians and reptiles comprising his central peninsular assemblage, including two amphibians, 16 lizards and 14 snakes. To this list may be added *Hyla regilla deserticola, Cnemidophorus labialis, Gerrhonotus multicarinatus* ssp., *Lichanura roseofusca gracia, Tantilla planiceps eiseni* and *Petrosaurus repens.*

As I have delimited the Central Desert, Savage's inclusion of *Scaphiopus couchi* and *Dipsosaurus dorsalis* should be considered marginal. Both genera in Baja California del Norte show a decided preference for mesquite and creosote bush deserts. These plant communities are rare and never extensive in the coastal strand region. Only inland and south of El Arco (below 28°N. latitude), where they were prominent, did we observe *Dipsosaurus dorsalis.*

The following snakes, included by Savage in his Peninsular Desert assemblage, were not recorded in the survey: *Leptotyphlops humilis, Lichanura trivirgata, Arizona elegans, Masticophis lateralis, Sonora mosaueri* and *Crotalus mitchelli*. As pointed out by Myers and Rand (1969), snakes are a herpetofaunal segment that is difficult to sample adequately, owing in part to their lower population densities and their behavioral and structural adaptions designed to avoid discovery.

None of the five species reported for the first time from the Pacific slopes of the Central Desert appear to be recent arrivals. They were probably overlooked during previous years of faunal exploration.

Sauromalus australis and *Petrosaurus repens*, based upon current knowledge of their distribution, ecological associations, and tolerances, appear to be contiguous with the peninsular populations. The scarcity of favorable habitats within the area surveyed preclude their occurrence elsewhere.

Analysis of the distribution of *Gerrhonotus multicarinatus* spp., contrary to Savage's (1960) interpretation, indicates a southward expansion of its range since glacial maximum via the cool, moist coastal corridor. The same may be true for other temperate-tolerant types such as *Tantilla planiceps eiseni, Coleonyx variegatus abbotti* and *Lichanura roseofusca gracia*. The ranges of other temperate adapted forms from the Cape refugium, such as *Gerrhonotus paucicarinatus* may be expanding northward via the Pacific coastal corridor.

The *Crotaphytus collaris* of Mesa de San Carlos appear to represent an isolated population. The discontinuity of favorable habitat and climatic conditions within the survey area, excluding the Sierra Colombia with summits near 762 meters, together with the apparent distributional gap between this population and the peninsula's east coast populations seem to support this view.

San Carlos Mesa is about 15 miles long in a northwestern and southeastern direction by six miles wide and rises to an altitude of from 422 to 739 meters. The basaltic rock outcrops around the edge and on the top of the mesa provide suitable habitat for *C. collaris*. The mesa proper is a favorable habitat for the species. In contrast to the surrounding lowlands and foothills, it is subject to a greater duration and intensity of solar radiation, and concomitantly less frequent and shorter durations of coastal cloud cover and fog.

Phyllodactylus xanti sloani probably represents a marginal population of the mainland stock that recently immigrated to the Pacific slope via the foothills of the southern extremity of the Sierra de San Pedro Mártir occupying marginal, but suitable habitats to the north and south.

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to the Belvedere Scientific Fund of San Francisco for their financial support of this survey.

I am indebted to Thomas Cozens for his field and laboratory assistance, and to Margery Stinson for her laboratory and office assistance.

To Glen Contreras and Dennis Roberts for their able field assistance, I am especially grateful.

For the generous help, interest and encouragement of Allan J. Sloan, Curator of Herpetology, San Diego Natural History Museum, I am particularly indebted.

Special thanks are extended to Reid Moran, Curator of Botany at the SDNHM for his identification of the plants; to Elsie Arena for technical assistance; Bill Hite, Victor Limon and John Waldrup for field assistance; to Mike Langdon and DeDe Miller for their illustrations of Fig. 1 and Figs. 2,3 and 4, respectively; to Ted Karounos for Figs. 7 and 8; to Mr. and Mrs. Robert Eckhart for office and laboratory assistance; to Richard P. Phillips, for his letters of introduction which proved to be invaluable assets; to Richard G. Zweifel, American Museum of Natural History, for the loan of *Gerrhonotus* from Baja California; to Charles Coutts and Eugene Stevens, Palomar College, for placing the facilities of the Life Sciences Division at my disposal; and to Leon Rector for his excellent preparation and maintenance of the vehicles used in the survey.

I am particularly grateful to James R. Dixon, Richard Ethridge, Reid Moran, Clifford H. Pope, Allan J. Sloan and Ira L. Wiggins for their sound editorial comments and criticisms of the manuscript.

My sincerest appreciation is extended to Mrs. Norrine Keesee and Mrs. Sophie Bartlett who typed the final body of the manuscript, and the tables, respectively.

I am also thankful for the help and cooperation of Dr. Rodolfo Hernandez Corzo, Director General de la Fauna Silvestre de la Secretaria de Agricultura y Ganaderia, who issued the collector's permit.

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